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[1] *Amer. J. Sci., New Haven*, **31**, 1886, (377).

[2] *Proc. Amsterdam Acad.*, **17**, 1914, (445); and **18**, 1915, (1).

[3] This modification is essential, as the symmetrical apparatus of Michelson aud Morley does not admit of ray separation.

A COMPARISON OF WHITE AND COLORED TROOPS IN RESPECT TO INCIDENCE OF DISEASE

By Lieutenant-Colonel A. G. Love, M.C. U. S. A. and Major C. B. Davenport, Sanitary Corps, U. S. A.

Read before the Academy, November 18, 1918

This paper is an analysis of over half a million admissions to sick report of troops in camps in the United States. Of these 531,445 were for whites and 15,186 for colored troops. The relative frequency of disease in the two 'races' was as 974 to 1155; that is, the colored troops were about 19% more liable to go on sick report than the white troops.

The grounds of sick report are very numerous; so we shall consider only the commoner ones. All comparisons will be of the so-called mean annual rate per 1000 men. The data are those collected for the Report of the Surgeon General of the Army, 1918. Some comparative data have occasionally been included derived from the nine preceding annual reports.

In many cases the morbidity rate is almost the same for the white and colored troops. In this paper particular attention is paid to those diseases that have a strikingly different rate in the two races. It is to be kept in mind that all troops had been subjected to the same examination at induction, in order to exclude chronic diseases; and that they lived under equally good sanitary conditions.

First, may be considered the diseases that are commoner in colored than in white troops. These fall into four groups (a), those in which the excess is due to the fact that fewer of the colored men had become artificially immunized by inoculation before, or at, mobilization. They probably brought their disease to camp; or failed to get a reaction there; (b) those in which there is a lower natural immunity in the negro; (c) venereal disease and its complications, (d) other diseases.

(a) Of the diseases that are due to lack of acquired immunity, smallpox is the most striking. The morbidity rate for this disease is for colored troops 9 times that for white troops (there being 146 admissions altogether). Chickenpox was relatively 8 times as common in colored as in white troops.

(b) Of the diseases for which negroes lack relative natural resistance tuberculosis of the lungs and pneumonia take first places. There were over 2½ times the admission rate for tuberculosis of the lungs in colored as in white troops in 1917. This is a little greater difference than the average of the past ten years,—where the colored have about 2 times the admission rate of white troops. In tuberculosis of other organs the rate for colored troops is twice that for white.

In both lobar and broncho-pneumonia the morbidity rate of colored men exceeds that of white. For 1917 the rate for lobar pneumonia was 4½ times, for broncho-pneumonia 3 times, as great for colored as for white men. In the ten year record the colored rate is 2.2 times the white rate for broncho-pneumonia. Given, then, troops under similar environment in the presence of conditions favoring pneumonia, there are relatively two to three times as many colored troops as white who show symptoms of the disease.

(c) *Venereal disease.*—In the Army that was mobilized in 1917, the rate for syphilis was about 4 times as great in colored as white troops, for chancroid 4½ times, for gonococcus infection 2½ times. Combining the data of the last ten years the rate for all venereal diseases for colored troops is a little less than double that for whites. The difference between the races in incidence of venereal diseases is probably due partly to a difference in social pressure, partly to a difference in ability to control the sex instinct.

This greater infection of colored troops with venereal disease leads to the greater incidence in that race of various complications of those diseases. Thus, retinitis, iritis, cerebro-spinal meningitis, various diseases of the spinal cord—largely, probably, complication of syphilis—are commoner among the colored soldiers. Similarly, arthritis, osteomyelitis, endocarditis, nephritis and urethritis—complications of gonorrhea—are 2 to 3 times commoner in colored troops than in white.

Of other diseases there are few in which the colored rate is markedly greater than the white. The colored indeed show about 100% more epilepsy and hysteria than the whites, more drug addiction and double the amount of neuralgia and hemorrhoids; and that is about all.

Of diseases that are less common in colored than in white troops there are, first of all, skin diseases. Thus acute abscesses and inflammations of the connective tissue of the skin are about one-third as common in colored as white soldiers; boils are one-fourth as common; dermatitis from traumatisms one-third as common and venomous bites and stings have much less effect. As is well known, the reaction of the skin to cuts differs in the two races. Colored persons tend to form keloid tumors, or skin ridges, along the scar. In civil life deaths from skin cancer are one-fourth as common in colored as white citizens. This by no means exhausts the catalogue of skin differences in the two races.

Also, in the quality of the teeth there is a difference. It is not rare to find negroes who at twenty to thirty years have lost nearly all their teeth through the use of mercury. But, on the other hand, it is much commoner to find negroes than Anglo-Saxons who, at twenty to thirty years, have teeth that show no sign of decay, even where no especial care has been taken of them. The negro teeth are naturally resistant to the organism of tooth caries.

Diphtheria, scarlet fever and German measles are from one-half to one-fourth as common in colored as white men. This experience with morbidity in camps agrees with the census mortality rates of civil life. Thus, for the registration area of the United States (1915) the rates for white and colored respectively are: for scarlet fever, 3.7 and 1.3; for diseases of the larynx, 8 and 4. Also while admissions in camp for measles-complicated-by-lobar-pneumonia are slightly greater in colored than in white troops, cases of measles-complicated-by-broncho-pneumonia are only about half as common in colored troops.

Influenza in the troops during 1917 had a rate of 28 for colored men—about half that for white men (58); and during the past ten years only about one-fourth. It is commonly held that colored children are much less apt to be attacked by the organism of infantile paralysis, which, like influenza, enters the body through the naso-pharynx. Thus, in general, the diseases of the upper respiratory tract are much less common in colored than white people.

In general the skin, not only on the surface of the body but also that which infolded to form the lining of the mouth and naso-pharynx, is much more resistant to micro-organism in negroes than in whites. The white skin seems to be relatively a degenerate skin in this respect.

Moreover, the nervous system of the uninfected negroes shows fewer cases of instability than that of whites. Thus, there is only about one-third as much neurasthenia recorded in camps in 1917; about one-third as many cases of constitutional psychopathic state and one-half as much alcoholism in colored as in white troops. Functional cardiac disturbances of nervous origin are half as common. Eye defects are relatively few, and there is about half as much liability to refractive errors as in whites. Ear diseases are about half as common.

Metabolically, the uninfected colored troops seem less liable to disturbances than white troops. Diabetes is only half as common in the negroes as the whites and about the same is true of urinary calculi. Inflammations of the gall bladder are also much less frequent.

To sum up: The colored troops are relatively less resistant to diseases of the lungs and pleura as well as to certain general diseases, like tuberculosis and smallpox; they are also much more frequently infected with venereal diseases and suffer wide spread complications of these diseases.

But the uninfected negro is highly resistant to diseases of the skin, mouth and throat. He seems to have more stable nerves, has better eyes and metabolizes better. Thus, in many respects the uninfected colored troops show themselves to be constitutionally better physiological machines than the white men.

(Publication approved by the Office of the Surgeon General.)

Admissions to Sick Report, United States Troops, for Year 1917
(*From Table No. XV, Report Surgeon General, U. S. Army, 1918*)

NUMBERS OF INTERNATIONAL CLASSIFICATIONS	UNITED STATES		
		White	Colored
	Mean strength	545,518	13,150
	Cause of admission to sick report	Ratio per 1000 of mean strength	
	I. Infectious Diseases (Excluding Tuberculosis and Venereal)		
1	Typhoid fever	0.41	0.23
2	Typhus fever	0.01	
3	Relapsing fever (all)	0.05	
4	Malarial fevers (all)	7.50	5.85
4a	Malarial fever, estivo-autumnal	0.20	0.38
4b	Malarial fever, mixed	0.01	0.08
4c	Malarial fever, quartan	0.10	0.08
4d	Malarial fever, tertian	4.10	3.19
4e	Malarial fever, undetermined	3.09	2.13
5	Smallpox	0.22	1.98
6	Measles (all)	83.11	87.07
6a	Measles, uncomplicated	78.96	82.28
6c	Measles with broncho pneumonia	2.48	1.37
6d	Measles with lobar pneumonia	1.25	1.75
6f	Measles with other complications	2.42	1.67
7	Scarlet fever	3.58	0.84
8	Whooping cough	0.04	0.08
9	Diphtheria and results	2.12	0.46
10	Influenza (all)	58.44	27.83
14	Dysentery (all)	0.87	0.84
14a	Dysentery, bacillary	0.09	0.08
14b	Dysentery, balantidic		
14c	Dysentery, entamæbic	0.35	0.30
14d	Dysentery (other protozoal)		
14e	Dysentery, unclassified	0.42	0.46
15	Plague	0.01	
17	Leprosy	0.01	
18	Erysipelas	1.17	1.44
18b	Meningitis, cerebrospinal (epidemic)	1.68	4.11
19a	Chicken pox	0.44	3.42
19b	Diphtheria bacillus carrier	0.45	1.14
19c	German measles	16.36	4.41
19d	Hemoglobinuric fever (nonmalarial)	0.01	0.08
19e	Paratyphoid fever A	0.02	
19f	Paratyphoid fever B		
19g	Trench fever		
19i	Typhoid bacillus carrier	0.02	
19j	Typhoid vaccination	17.65	11.25
19k	Vaccinia	15.69	6.16
19l	Mumps	38.93	37.26

ADMISSIONS TO SICK REPORT—*Continued*

NUMBERS OF INTERNATIONAL CLASSIFICATIONS	UNITED STATES		
		White	Colored
	Mean strength	545,518	13,150
	Causes of admission in sick report	Ratio per 1000 of mean strength	
20	Septicæmia, general	0.09	
20b	Pyæmia, surgical	0.01	
21	Glanders	0.01	
22	Anthrax	0.01	
24	Tetanus	0.01	
25	Trench foot		
25a	Mycoses (others)	0.04	
26	Pellagra	0.04	0.23
27	Beriberi		
47	Rheumatic fever	8.68	6.39
11, 19, 18a, 18c 20a	Infectious disease (others)	2.48	3.19
	II. Tuberculosis (All)		
28	Tuberculosis of lungs	11.69	32.02
29	Miliary tuberculosis, acute	0.07	
30–35	Tuberculosis (others)	0.76	1.90
	III. Venereal Diseases (All)		
37	Syphilis (all)	14.22	54.68
37a	Syphilis, hereditary	0.03	
37b	Syphilis, primary	3.85	20.08
37c	Syphilis, secondary	8.34	22.13
37d	Syphilis, tertiary	2.00	12.47
38a	Chancroid	12.39	52.78
38b	Gonococcus infection	82.47	203.04
	IV. General Diseases (Others)		
36	Rickets	0.12	
39–45	Cancer and other malignant tumors	0.15	
46	Benign tumors	1.17	1.75
48	Arthritis	5.74	10.58
48a	Gout	0.03	
49	Scurvy	0.01	
50	Diabetes mellitus	0.18	0.08
51a	Diseases of the thyroid gland (goiter simple excepted)	1.09	0.38
51b, 52 53b, 116	Diseases of the ductless glands (thyroid excepted)	0.07	0.08
53a	Leukemia	0.01	
54	Anemia	0.20	0.23
55a	Purpura rheumatica	0.01	
56	Inebriety, drug addiction	0.75	1.30
56a	Alcoholism	2.45	1.06
57–59	Poisoning, chronic	0.04	
55, 88	General diseases (others)	5.12	8.14

ADMISSIONS TO SICK REPORT—*Continued*

NUMBERS OF INTERNATIONAL CLASSIFICATIONS	UNITED STATES		
		White	Colored
	Mean strength	445,528	13,150
	Causes of admission to sick report	Ratio per 1000 of mean strength	
	V. Nervous System, Diseases of (All)		
61	Meningitis, simple	0.10	0.23
62	Locomotor ataxia	0.07	
63	Diseases of the spinal cord (others)	0.21	0.53
64	Apoplexy	0.04	
66	Paralysis, cause not specified	0.38	0.46
69	Epilepsy	2.88	6.54
72	Chorea	0.14	
73	Hysteria and results (psychoses excepted)	1.17	2.05
73a	Neuralgia	1.83	3.57
73b	Neuritis	1.13	1.06
74	Neurasthenia	1.50	0.46
60, 65, 70 73, 74a	Diseases of the nervous system (others)	2.21	2.59
	VI. Mental Alienation		
67	General paralysis of the insane	0.05	0.08
68a	Constitutional psychopathic states	0.86	0.30
68b	Dementia precox	1.46	1.75
68c	Mental deficiency	2.80	2.89
68d	Psychasthenia	0.17	
68e	Psychoneurosis	0.42	0.30
56b	Psychoses (alcoholic)	0.25	0.23
68f	Psychoses (nonalcoholic)	0.82	1.37
68	Mental alienation (others)	0.21	0.30
75	*VII. Eyes and Their Annexa, Diseases of*		
75a	Conjunctivitis	7.50	8.44
75b	Trachoma	0.84	0.38
75c	Refractive errors	1.01	0.68
75e	Iritis	0.44	1.06
75f	Keratitis	0.52	0.91
75g	Choroiditis	0.08	
75h	Retinitis	0.10	0.76
75i	The eyes and annexa (other diseases of)	2.71	5.40
76	*VIII. Ear, Diseases of*		
76a	Mastoiditis	0.45	0.15
76b	Otitis media	10.64	5.48
76c	Ears, other diseases of	0.83	0.91
86	*IX. Nasal Fossæ, Diseases of*		
86a	Adenoids	0.38	0.30
86b	Deviation of nasal septum or spurs	2.04	0.30
86c	Sinusitis	1.49	1.60
86d	Nasal fossæ, other diseases of	13.16	10.04

ADMISSIONS TO SICK REPORT—*Continued*

NUMBERS OF INTERNATIONAL CLASSIFICATIONS	UNITED STATES		
		White	Colored
	Mean strength	545,518	13,150
	Causes of admission to sick report	Ratio per 1000 of mean strength	
	X. Throat, Diseases of		
87	Larynx, diseases of	8.38	4.56
100	Pharynx, diseases of	14.54	12.47
100a	Tonsils, diseases of	77.64	50.95
	XI. Circulatory System, Diseases of		
77	Pericarditis	0.08	0.08
78	Endocarditis, acute	0.15	0.53
79	Valvular heart diseases	4.21	6.08
79a	Heart, other organic diseases of	1.94	4.56
80	Angina pectoris	0.13	0.35
81a	Aneurysm	0.02	
81	Arteries, other diseases of	0.13	0.15
82	Embolism and thrombosis	0.05	
83a	Hemorrhoids	6.55	14.60
83b	Varicocele	3.72	2.51
83	Veins, other diseases of	1.89	1.67
84a	Status lymphaticus		0.15
84	Lymphatic system, other diseases of	4.07	5.86
85a	Cardiac arrhythmias	0.06	
85b	Cardiac murmur, not organic	0.03	0.08
85c	Cardiac disorders, functional	0.19	0.08
85d	Hemorrhage	0.48	0.68
85	Circulatory system, other diseases of	1.08	2.36
	XII. Respiratory System, Diseases of		
89, 90	Bronchitis	74.10	61.75
91	Broncho-pneumonia	2.51	7.30
92	Pneumonia, lobar	11.47	53.69
92b	Pneumonia, unclassified	0.08	0.23
93	Pleurisy	5.17	9.43
95	Gangrene of lung	0.01	
98	Abscess of lung	0.01	
96, 97	Respiratory system, other diseases of	2.17	4.03
	XIII. Digestive System, Diseases of		
99	Mouth and annexa, diseases of	3.91	4.18
101	Esophagus, diseases of	0.01	
102	Ulcer of the stomach	0.49	0.30
103	Stomach, diseases of (ulcer and cancer excepted)	10.68	9.73
106	Ankylostomiasis	0.58	
107a	Intestinal parasites, others	0.41	0.38
108	Appendicitis	9.83	6.31
109	Hernia	8.98	10.57

ADMISSIONS TO SICK REPORT—*Continued*

NUMBERS OF INTERNATIONAL CLASSIFICATIONS	UNITED STATES		
		White	Colored
	Mean strength	545,518	13,150
	Causes of admissions to sick report	Ratio per 1000 of mean strength	
109a	Intestinal obstruction	0.15	0.23
105, 110	Intestines, other diseases of	47.35	33.76
112	Hydatid tumor of liver		
113	Cirrhosis of the liver	0.05	
114	Cholelithiasis	0.08	
115	Cholecystitis	0.87	0.38
115a	Liver, other diseases of	1.97	0.61
117	Peritonitis, acute diffuse	0.02	
117a	Peritonitis, acute local	0.02	
117b	Peritonitis, chronic	0.01	0.08
117c	Peritoneal adhesions	0.37	
118	Other diseases of the digestive system	0.23	0.30
118a	Pancreatitis		
	XIV. Genito-Urinary System and Annexa, Nonvenereal Diseases of		
119	Nephritis, acute	0.47	0.76
120	Nephritis, chronic (Bright's disease)	0.71	0.91
122	Kidney and annexa, other diseases of	0.72	0.91
123	Calculi of urinary passages	0.43	0.23
124	Bladder, diseases of	3.24	4.41
125	Urethra, diseases of	0.83	1.37
126	Prostate, diseases of	0.19	0.15
127	Male genital organs, diseases of (nonvenereal)	4.47	6.54
	XV. Skin and Cellular Tissue, Diseases of		
142	Gangrene	0.03	
143	Furuncle	8.78	2.13
144	Acute abscess	5.83	2.89
144a	Cellulitis	4.52	1.14
145	Skin and annexa, other diseases of	17.29	11.86
	XVI. Bones and the Organs of Locomotion, Diseases of		
146	Osteomyelitis	0.36	0.61
146a	Bones, other diseases of (tuberculosis excepted)	0.93	1.44
147	Joint, diseases of (rheumatism and tuberculosis excepted)	1.59	1.98
149	Pes planus	8.40	9.28
149a	Organs of locomotion, other diseases of	10.71	9.89
	XVII. Congenital Malformations and Ill-Defined Diseases		
150	Congenital malformations	8.23	12.09
189	Not specified or ill-defined diseases	36.17	51.41
	Total for diseases	882.54	1064.41

ADMISSIONS TO SICK REPORT—*Continued*

NUMBERS OF INTERNATIONAL CLASSIFICATIONS	UNITED STATES		
		White	Colored
	Mean strength	545,518	13,150
	Causes of admission to sick report	Ratio per 1000 of mean strength	
Office classification	*Traumatism Produced by External Causes* Total	91.68	90.42
03	Bites	0.13	
04	Burns	1.54	1.06
05, 06	Burns, chemical and X-ray	0.34	0.08
09	Compression (brain)	0.01	
10	Concussion (brain)	0.63	0.23
12	Contusion	3.41	0.68
14	Crushing	0.43	0.23
17–20	Dermatitis from traumatism	2.23	0.68
21	Dislocation of joint	1.84	1.52
62	Dislocation, articular, cartilage of knee	0.16	
22, 23	Drowning (except suicides)	0.04	
28	Epiphyseal separation	0.01	
08, 11, 13, 32,33, 68,69	Eye and annexa, traumatisms	0.34	0.46
34	Foreign bodies	0.25	0.30
36	Fracture, simple	7.63	4.41
35	Fracture, compound	0.52	0.46
38–48	Fracture, faulty union	0.13	0.23
0x	Fracture near joint, with dislocation	0.02	
37	Fracture, comminuted	0.22	0.30
50	Gases deleterious, absorption of	0.03	
51	Gunshot wound	1.02	1.44
552–56	Hemorrhage and results	0.09	
59	Homicides	0.01	0.23
66	Poisoning by food	1.04	0.61
67	Poisoning, other acute	0.22	0.08
96	Secondary result of injury	5.55	11.79
73	Sprain of joint	18.69	16.73
75	Strain	2.88	3.19
79	Suicide	0.05	0.15
81	Synovitis, traumatic, cause undetermined	0.97	0.91
85	Venomous bites and stings	0.31	0.08
93	Wounds, multiple	0.07	0.08
94	Wounds, penetrating	0.16	0.53
92	Wounds, extensive	0.01	
95	Wounds, perforating	0.90	1.82
86–91	Wounds, others	30.62	32.02

ADMISSIONS TO SICK REPORT—*Concluded*

NUMBERS OF INTERNATIONAL CLASSIFICATIONT	UNITED STATES		
		White	Colored
	Mean strength	545,518	13,150
	Causes of admission to sick report	Ratio per 1000 of mean strength	
00–02, 07, 15, 16, 24–27, 29–31, 49, 57, 58, 60, 61, 63–65, 70–72, 74, 76–78, 82–84, 97–99	Traumatisms, others	9.14	10.04
80	Sunstroke	0.04	0.08
	Total for diseases	882.51	1064.41
	Total for external causes	91.69	90.42
	Grand total	974.19	1154.83

PERTURBATIONS AND TABLES OF THE MINOR PLANETS DISCOVERED BY JAMES C. WATSON

By ARMIN O. LEUSCHNER

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Read before the Academy, April 16, 1916

Among the many important contributions to Astronomical Science by James C. Watson, one of the original members of the National Academy of Sciences, is the discovery of twenty-two minor planets commonly known as the Watson asteriods. The first of these, (79) Eurynome, was discovered at Ann Arbor on September 14, 1863, and the last, (179) Klytaemnestra, on November 11, 1877, three years before his death. By his will a fund was bequeathed in trust to the National Academy of Sciences for the purpose of promoting astronomical research. One of the objects specifically designated was the construction of tables of the perturbations of the minor planets discovered by the testator. From the beginning Prof. Simon Newcomb was a